THE ROLE OF MUSIC AND YOUNG CHILDREN: THE BRAIN DEVELOPMENT

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We generally think of music as something created by humans for entertainment purposes. Without knowingly, music can make us smarter. Developing a child's musical ability may actually improve her ability to learn and be successful at other disciplines, such as language, math and science.

To understand how this is possible, let's look at what we know about the brain. The latest neurological research on brain development and its relationship to music are beginning to find that the relationship on brain development to music education reveals that training in music has a positive effect.

Our brain has more than 100 billion neurons, each linking to other neurons creating trillions of connections. If the neurons are used they become stronger, if they are not used they may die, but it all depends on the experiences of childhood which determines the lives of these neurons. In response to the stimuli the babies receive, their brains are constantly building themselves by forming new connections, or synapses. The higher the number of these different types of connections it forms, the better able the brain is to handle any new information it receives.

It is necessary for a young child's brain to experience a variety of experiences to create the many different synapses it will need over a lifetime, but recent research is showing that we are "pre-wired" to receive and decipher

musical stimuli. It has been shown that fetuses can hear songs in the womb and will stop sucking in order to listen better when the same familiar songs are played for them. Babies as young as three months have been found to form associations with music to remember certain events.

Musical experiences are displayed in the brain as multimodal, involving auditory, visual, cognitive, effective, and motor systems. Both the right and left hemispheres of the brain are involved in processing music. The music enrichment stimulates the formation of synapses and the growth of dendrites in the brain. Training children in music at an early age exercises higher brain functions, including complex reasoning tasks. The pathways we use for spatial reasoning are similar to the music pathways in our brain. When we listen to music, the spatial pathways are “turned on” and ready to be used.

Music, especially the classical music such as Bach, Beethoven, or Mozart is different from music such as *rock* and *country* has a more complex musical structure. Babies as young as three months can pick out that structure and even recognize classical selections they have heard before.

Researches think the complexity of classical music is what primes the brain to solve spatial problems more quickly. So listening to classical music may have different effects on the brain than listening to other types of music. This doesn’t mean that other types of music aren’t good. Listening to any kind of music helps build music-related pathways in the brain. And music can have positive effects on our moods that may make learning easier.

Children process information in different ways. The three types of learning styles are visual, auditory and kinesthetic. Music can aid in the use of using the three learning styles. Music alone is auditory, music along with pictures and words is visual, and music combined with motions or dance is kinesthetic. According to the article. “Why Do Schools Flunk Biology?” scientist believe that music trains the brain for higher forms of thinking. The more we learn the more our neurons are stimulated to grow and contain more information. Using the three learning styles in the classroom will allow children to prosper and aiding learning with music can have a positive effect.

In fact, a child musical development seems to be very similar to language development. It follows a predictable sequence and includes things like learning to sing in tune and marching to a particular beat. This is the time when the child is learning to make a mental picture of the music she hears in her mind. That representation is called audition, and it is critical to musical growth.

Also important to musical growth is the ability to participate in music through singing and movement. Through movement, children learn to further use their bodies as instruments. In order to audiate rhythm in their minds, children must experience it in their bodies. If they don’t learn to do this at an early age, it is much harder as they get older. Most basic motor patterns develop before age five and are merely strengthened after this age.

Critical periods are windows of opportunity for music from about age three to ten years old. This is when learning music, as well as learning with music, is most beneficial. On the question of whether or not there is a window of opportunity for learning to play an instrument, several studies suggest that beginning music training early is correlated with greater growth in certain areas of the brain. For example, researches in Germany identified the region of the brain responsible for perfect pitch – a part of the left hemisphere, which also involved in speech, called the planum temporale. In the musicians with perfect pitch, the planum temporale was twice as big as in either the non musicians or the musicians lacking perfect pitch. In this study and several others, 95 percent of musicians with perfect pitch started music lessons before age seven. According to this study, it seems that early music training is associated with more growth in this one particular brain region. “If …training starts later or is absent altogether, perfect pitch rarely shows up” (Diamond 1998).

Preschool and kindergarten teachers have known for a long time that children learn best through songs. They remember the material easier and it is easier to help them engaged in the activity. Songs, charts, poems, and raps will improve memory of content facts and details and provide a hook for retrieving information easily later.

Here are some proves that music can make us smarter. Shaw and Rauscher (1993) explored how certain kinds of exposure to music affect the brain. They

looked at how learning to sing and to play the keyboard might influence the spatial-temporal skills of pre-school children. After eight months of keyboard lessons, the results demonstrated that preschooler tested showed a 46 percent boost in their spatial IQ, which is crucial for higher brain functions such as complex mathematics and science that draw heavily upon spatial-temporal reasoning. According to Rauscher, this is because music is a spatial task. In addition, while you are engaging in music you are feeling, seeing and learning it all at once.

A Rockefeller Foundation study stated that music majors have the highest rate of 66.7 percent of admittance to medical school. (http://www.brainy-child.com/article.smartmusic.html)

In The Silicon Valley, the very best engineers and technical designers are practicing musicians. (http://www.brainy-child.com/article/smartmusic.html)

Students with coursework or experience in music performance scored an average of 52 points higher on the verbal portion of the SAT and 36 points higher on the math portion of the SAT compare to students with no coursework or experience in the arts (compiled by MENC in 1995). (http://www.brainy-child.com/article/smartmusic.html)

In a study done by Martin F.Gardiner and his colleagues found that a certain kind of musical training, the Kodaly method, which includes rhythm

games and learning to sing songs progressing in specific increments toward greater difficulty, positively affects first and second graders' math skills.

Debra Viadero (1998) summarizes the Gardiner study results in her Education Week article, "Music on the Mind": "At the end of seven months, the students getting the specialized musical training …in math they zoomed ahead of their peers - even though they had started out slightly behind." This suggest that musical training improve the children ability to learn and be successful such as in mathematics.

Lamb and Gregory (1993) of the University of Manchester's Department of Psychology published the results of their study on the relationship between the ability to discriminate musical sounds and reading performance. "Children achieving high scores on pitch discrimination also did well on phonemic awareness and showed good reading performance." According to the study, it seems that musical training is associated with an improvements in reading performance.

There are many ways that parents can do to support their child's musical growth at home. You can begin by singing to your baby, even before it is born. Afterwards, you can sing to your infant often and make eye contact. Hearing your voice helps your baby begin to learn language. Babies love the patterns and rhythms of songs. And even young babies can recognize specific melodies once

they've heard them. Very young babies this age have been shown to be able to distinguish differences in melody and frequency and can imitate them. Studies also suggested that babies preferred simpler melodies to more complex ones. Choose simple, soothing melodies such as lullabies, blues or smooth jazz.

You can sing with your child. As children grow, they enjoy singing with you. Older babies will be ready for more lively music such as "Row, Row, Row Your Boat", and "Twinkle, Twinkle Little Star". You can also introduce the idea that movement can coincide with the music by gently clapping the child's hands to the beat, or helping him gesture along with the lyrics. Crawlers and toddlers will enjoy singing along and doing the accompanying movements to songs like "Head, Shoulders, Knees and Toes", and "Old MacDonald". They especially love making the animal sounds or the sounds of cars and so forth. You can also march or do simple steps to their favourite songs. Children are happy when they are bouncing, dancing, clapping, and singing with someone they love and trust. This increased ability to participate in music will only heighten the babies' enjoyment of it, and the motions they perform will help foster greater body awareness. You should simply have fun with your child and do not attempt to correct them. Setting words to music actually helps the brain learn them more quickly and retain them longer. That's why we remember the lyrics of songs we sang as children, even if we haven't heard them in years.

Play music for your baby. Expose your baby to many different musical selections of various styles. Simple instruments such as easy to grasp percussion instruments can also be introduced. Drums, shakers, triangles or tambourines allow the child to experiment with rhythm. You should let the child discover how to use each one, and follow her beat rather than asking her to try to follow theirs. If you play an instrument, practice when your baby is nearby. But keep the volume moderate. Loud music can damage a baby's hearing. According to Ken Guilmartin, founder of the Music Together program, "…although children acquire information and learn skills from many sources, they develop the essential disposition to learn only from the model of their primary caregivers." The parents involvement in her musical development in the early childhood years can help set her up for a lifetime of successes.

In addition to support the child's musical growth at home, we should ask them to start music lessons early. Learning to play an instrument can have longer-lasting effects on spatial reasoning compare to listening to music only. Researchers believe that musical training creates new pathways in the brain. There are early childhood music programmes that can be introduced to children. Such programs is Suzuki method, which teaches children as young as three and four years to play an instrument by teaching the parents first and allowing the child to watch and imitate them later. If you want your child to learn instrument,

you don’t need to wait until elementary school to begin lessons. Young children’s developing brain are equipped to learn music. Most four and five years old enjoy making music and can learn the basics of some instruments. And starting lessons early helps children build a lifelong love of music.

However if parents decide to nurture their child’s musical development, they need to remember that they are a key factor in this important process. Studies done by early childhood educators are showing that the musical ability of children raised in a household rich in musical experiences far surpasses that of children living in household lacking this richness.

Encourage your child’s school to teach music. Singing helps stimulate the brain, at least briefly. Over time, music education as a part of school can help build skills such as coordination and creativity. And learning music helps your child become a well-rounded person. Music helps create learning states that assist in holding attention and increasing retention of information. Music stabilizes mental, physical and emotional rhythms and facilitates students’ attaining a state of deep concentration and focus. In this state large amounts of content information can be processed and learned. Songs, chants, poems, and raps will improve memory of content facts and details and provide a hook for retrieving information easily later.

As conclusion, music training and exposure to a wide variety of music as complex as Mozart’s should be valued because it might raise a child’s IQ score.

Music speaks in a language that children instinctively understand. It draws children into its orbit, inviting them to match its pitches, incorporate its lyrics, move to its beat, and explore its emotional and harmonic dimensions in all their beauty and depth. By learning to recognize and consciously implement music in your child's life you can begin to communicate and connect with him even before he is born. Music also can stimulate brain growth in the womb and throughout early childhood; improve his language ability, including vocabulary, expressiveness, and ease of communication; and improve his reading, writing, mathematical, and other academic skills as well as his ability to remember and to memorize.

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